tube of cellophane. But the chromosomes themselves undergo many changes of position relatively to one another and to the other parts of the cell; and indeed it is only during certain phases of the life and maturation of the egg-cell that the chromosomes can be seen to assume a characteristic spatial distribution. At other times they seem to become all tangled together or even perhaps to be resolved into their constituent parts, which are rea'ssembled at the appropriate time in the distribution commonly described as characteristic of the species.

Still more decisive against the mechanical theory is the fact that in some cases a piece of one chromosome may become broken off and either re-attached in inverted position to the main part of the same chromosome, or, in some cases, attached to another chromosome, with perhaps exchange of position with a piece of another—in the instances known as £ cross-over'. The brilliance of the methods by means of which these facts have been established should not blind us to their significance.

There is good evidence that after such changes of the normal spatial relations of many of the genes of an egg, the egg may nevertheless develop normally, or almost normally. Again, in certain cases the number of the chromosomes may be doubled with but small effect upon the course of development of the adult features. If the mechanical theory were true, such great changes of the spatial relations of many genes should produce correspondingly great changes of the course of

development
of the embryo.

Phenomena of Restitution of Form

Similar insuperable difficulties for the mechanical
theory are presented by many well-established observa-